

preserved by the proposed solution suggests that, in addition to vasoactive effects, an additional cytoprotective and cryoprotective effect may also be important in ameliorating ischemic injury. These improvements are substantiated ultrastructurally by improved appearance of mitochondria in proximal tubular cells compared to mitochondria from kidneys not exposed to the proposed solution.

[0019] A machine perfusion solution of the invention may also contain components typically used in known machine perfusion solutions. *See*, U. S. Patent Nos. 4,798,824 and 4,879,283. For example, other components that may be utilized in the solution include: sodium gluconate and Mg gluconate, which are impermeant anions that reduce cell swelling, KH_2PO_4 , which provides acid-base buffering and maintains the pH of the solution, adenine, which is a precursor to ATP synthesis, and ribose, which reduces cell swelling during hypothermia. In addition, CaCl_2 , which is a calcium-dependent mitochondrial function supplement, HEPES, which is an acid-base buffer, glucose, which is a simple sugar that reduces cell swelling and provides energy stores for metabolically stressed cell, and mannitol and pentastarch, which are oncotic supporters, may also be added. NaCl and KOH may also be used for acid-base buffering and maintenance of the pH of the machine perfusion solution.

[0020] In a preferred embodiment, the organ or biological tissue preservation machine perfusion solution includes, but is not limited to:

Table 1

COMPOSITION	AMOUNT IN 1 LITER
Sodium Gluconate	40-160mM
KH ₂ PO ₄	10-50mM
Mg Gluconate	1-15mM
Adenine	1-15mM
Ribose	1-15mM
CaCl ₂	0.1-2mM
HEPES	1-30mM
Glucose	1-30mM
Mannitol	10-100mM
Pentastarch	40-60g/L
Prostaglandin E1	100-10,000mcg/L
Nitroglycerin	1-15mg/L
N-Acetylcysteine	0.1-5mg/L
Sterile Water	700-900mL

[0021] In a more preferred embodiment, the organ or biological tissue preservation machine perfusion solution includes, but is not limited to:

Table 2

COMPOSITION	AMOUNT IN 1 LITER
Sodium Gluconate	60-100mM
KH ₂ PO ₄	20-30mM
Mg Gluconate	3-8mM
Adenine	3-8mM
Ribose	3-8mM
CaCl ₂	0.3-0.8mM
HEPES	8-15mM
Glucose	8-15mM
Mannitol	15-50mM
Pentastarch	45-55g/L
Prostaglandin E1	250-2,500mcg/L
Nitroglycerin	3-8mg/L
N-Acetylcysteine	0.5-2mg/L
Sterile Water	700-900mL

[0022] In a most preferred embodiment, the organ or biological tissue preservation machine perfusion solution includes, but is not limited to: